MIMAP Bangladesh

Micro Impacts of Macroeconomic and Adjustment Policies in Bangladesh

Technical Paper No. 04

Globalization Poverty Interactions in Bangladesh

Mustafa K. Mujeri
Bazlul H. Khondker

ngladesh Institute of Development Studies (BIDS)
17, Agargaon, Sher-e-Bangla Nagar, G.P.O. Box : 3854
naka-1207, Bangladesh. Web site : www.bids-bd.org

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Visiting Fellow and Project Leader, MIMAP-Bangladesh, Bangladesh Institute of Development Studies, Dhaka.
Associate Professor, Department of Economics, University of Dhaka, Bangladesh

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Dhaka – 1207
Bangladesh.
Tel: 9143441-8
Fax: 880-2-8113023
E-mail: dg_bids@sdnbd.org
Web site: www.bids-bd.org

Globalization – Poverty Interactions in Bangladesh

Mustafa K. Mujeri
Bazlul H. Khondker*

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* Visiting Fellow and Project Leader, MIMAP-Bangladesh, Bangladesh Institute of Development Studies, Dhaka and Associate Professor, University of Dhaka, Dhaka respectively. The authors would like to express deep gratitude to Professors Jeffery Round of the University of Warwick and John Whalley of the Universities of Western Ontario and Warwick for their guidance and suggestions in carrying out the study. Useful comments were also received on an earlier draft of the paper from the participants at the Seminar on 'How Are Globalization and Poverty Interacting and What Can Governments Do About It?' in OECD Headquarters, Paris, 9-10 December 2002. The authors, however, are responsible for the views and any remaining errors.

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1. Introduction

Since independence in 1971, Bangladesh's external sector has undergone intensive reforms and policy changes. The country started with a restricted trade regime and a reversal of the policy towards a liberalized external sector began in 1975.[1] After the mid-1980s, a more comprehensive programme of stabilization and economic reforms was implemented under which the creation of a liberal trade regime was emphasized.[2] The argument was that such a strategy would relax the constraints of the small domestic market and provide access to foreign direct investment facilitating technology transfer, creating marketing network, and providing much-needed managerial and technical skills. While the potential benefits were well-argued as evidenced by the relatively quick implementation of trade reforms in the country compared to other reforms, how far the benefits have been realized remains a matter of controversy. It is argued that, for a country like Bangladesh, trade liberalization has both benefits and costs and whether the benefits would outweigh the costs would depend on how the country 'manages' the process to its advantage through strengthening the domestic economy, addressing the structural bottlenecks, and improving the policy regimes and institutional capabilities. Some studies point out that Bangladesh gained relatively little from the trade reforms of the 1990s (Mujeri 2002a, 2002b). Two issues of trade liberalization, however, still remain inadequately addressed. First, the distributional consequences as reflected in the differential impact on the welfare status of various socioeconomic groups and second, the impact on the labour market. Both the issues are important for Bangladesh in its fight against poverty. If trade liberalization creates disproportionate burden and adjustment costs for the poor groups in the society, it becomes important to undertake countervailing measures such that the process becomes more equitable. Similarly, with a segmented labour market, opening up of the economy may bring benefit to a few groups having specific skills while the poor workers at the lower ends of the skill profiles could remain the losers.

The present study seeks to address two specific issues related to trade liberalization in Bangladesh. First, analyze the poverty and distribution impacts of selected globalization measures in Bangladesh. More specifically, the analysis uses a multi-sector, multi-factor and multi-household computable general equilibrium (CGE) model of the Bangladesh economy to examine the impacts of trade liberalization and inflow of foreign capital on allocation of resources, distribution of income, and poverty status of different household groups. Second, identify the relative contribution of trade and other factors (e.g. technological change) in observed changes in wages of skilled and unskilled labour using a double calibration general equilibrium methodology. The objective of the analysis is to contribute to better understanding of the relationships between trade reforms and poverty in Bangladesh and help

[1] The inward looking policies of the period highlighted the concerns to conserve foreign exchange, create the industrial base through a protective domestic environment, and maintain a sustainable balance of payments. Strong arguments, however, were put forward against these policies on the ground that such policies had led to distorted incentive structures creating allocative and productive inefficiencies, external sector strains and anti-export bias, and slow growth. Trade and other reforms which started in the mid-1970s were linked to the policy based lending of the IMF and Import Programme Credit (IPC) of the World Bank.

[2] The programme covered different measures including fiscal, financial, trade and industrial policy reforms; public resource management; privatization; and institutional and sectoral reforms. These economy-wide reforms and structural adjustments, initiated in 1987, formed parts of the Structural Adjustment Facility (SAF) and the Enhanced Structural Adjustment Facility (ESAF) of the IMF and the World Bank. For details see Sobhan 1991, Mujeri et. al. 1993.

identify the policy options that are capable of promoting liberalization in a more equitable manner.

The paper is organized as follows. Section 2 provides a brief overview of the Bangladesh economy and major changes in the external sector due to liberalization. Section 3 analyzes the poverty trends with focus on changes in the labour market and skilled-unskilled wage differentials. The poverty and distributional outcomes of two liberalization policy simulations with a general equilibrium model of the Bangladesh economy are discussed in Section 4. In Section 5, factors contributing to observed changes in skilled-unskilled wage differentials over the liberalization period have been identified using a double calibration general equilibrium methodology. Finally, Section 6 provides some major policy implications.

2. The Bangladesh Economy and The External Sector

The Bangladesh economy has undergone significant sectoral changes since the 1980s (Table 1). The share of agriculture in GDP declined to around a quarter by 2000 while nearly a half of the GDP came from the service sector.[3] The average rate of GDP growth has been 4.3 per cent per year since the 1980s although the economy has shown a better growth performance in the 1990s. The growth in per capita GDP also accelerated during the 1990s both due to increased economic growth and reduction in the rate of population growth.

Table 1
Structure and Growth of the Bangladesh Economy

A.	Structure				
		Share (per cent) in GDP at constant 1995/96 prices			
		1980	1990	1995	2000
	Agriculture	33.2	29.5	26.0	25.6
	Industry	17.1	20.8	24.3	25.7
	Services	49.7	49.7	49.7	48.7
	Total	100	100	100	100
B.	**Growth**				
		Per cent at constant 1995/96 prices			
		1981-2000	1981-1990	1991-1995	1995-2000
	Agriculture	2.8	2.3	1.6	4.9
	Industry	6.4	5.8	7.5	6.4
	Services	4.8	3.7	4.1	4.8
	GDP	4.3	3.8	4.4	5.2
	Per capita GDP	2.3	1.6	2.4	3.6

Source: BBS 2000, 2001.

The External Sector: Major Changes

At the aggregate level, the growth and structural changes in merchandise trade can be seen in Table 2. Compared with an average annual growth of around 1 per cent in volume and 8 per cent in value terms in the 1980s, export volume increased by 15 per cent and export

[3] Despite the declining relative share of agriculture in GDP, agriculture continues to remain the major sector in terms of employment with about 62 per cent of total employed persons in 2000.

value by 11 per cent in the 1990s. In case of imports, the rates increased substantially to 21 per cent for volume and 11 per cent for value in the 1990s compared with (–)4 per cent for volume and 4 per cent for value in the 1980s. The trade basket indicates an increasing concentration of a broad category (manufactured goods) accounting for 91 per cent of total merchandise exports in 2000. The category consists of an assortment of simple manufactured goods e.g. readymade garments, leather and leather manufactures, fabrics, and made-up articles.[4] This indicates that the country's exports increased through exporting more of same or similar goods and, from this perspective, displayed little dynamism. Nevertheless, the share of foreign trade (exports and imports) in GDP increased to 33 per cent in 2000 from around 20 per cent in the early 1980s.

Table 2
Growth and Structural Change in Merchandise Trade

A. Growth						
		Average annual % growth				
		1980-1990			*1990-1999*	
Exports						
	Volume	1.0			14.9	
	Value	7.8			11.3	
Imports						
	Volume	-4.3			20.5	
	Value	3.6			10.7	
B. Structural Change						
	Merchandise exports			Merchandise imports		
	1980	*1990*	*2000*	*1980*	*1990*	*2000*
Total value ($ million)	793	1,671	6,500	2,353	3,618	8,360
			% of total			
Food	12	14	7	24	19	15
Agricultural raw materials	19	7	2	6	5	5
Fuels	0	1	0	9	16	7
Ores and metals	0	0	0	3	3	2
Manufactures	68	77	91	58	56	69

Source: World Bank 2000, 2002.

Trade Policy Reforms and Global Integration

During the last three decades, economic reforms have brought significant liberalization of the external trade and foreign exchange regimes. Both tariff and non-tariff barriers were dismantled. During 1978, there were 36 different tariff rates extending to 400 per cent along with widespread quantitative restrictions. The reforms in the 1990s aimed to rationalize and simplify the trade regime by lowering the tariff rates, phasing out quantitative restrictions, streamlining import procedures and introducing tax reforms. Several major changes may be noted:

(i) The highest customs duty rate was reduced from 350 per cent in 1992 to 37.5 per cent in 2000. The mean tariff declined to 22 per cent in 1999 from 114 per

[4] According to one study, the share of skill-intensive goods (e.g. chemicals, electrical and non-electrical machinery, computers and office equipment, communication equipment and similar products) in manufactured exports was 4 per cent for Bangladesh and 38.7 per cent for India in 1996, 2.4 per cent for Nepal and 2.9 per cent for Pakistan in 1997, and 9.2 per cent for Sri Lanka in 1994. See Mayer and Wood 2001.

cent in 1989 while weighted mean tariff declined to 19 per cent from 114 per cent over the same period[5];

(ii) Four slabs of duty rates were introduced in 2000 in place of 24 in the 1980s;

(iii) The number of commodities under the four-digit code subject to quantitative restrictions declined from 550 in 1987 to 124 under the Import Policy of 1997-2002. In 1992, about 12 per cent of around 10,000 tariff lines were subject to restrictions which declined to less than 4 per cent in 1999. At present, less than 0.5 per cent of imports, mainly in the textile category, are subject to quantitative restrictions; and

(iv) Tariff bands were narrowed down and import procedures simplified.

As a result, the mean tariff rates in Bangladesh now compare quite favourably with those in other South Asian countries e.g. India and Sri Lanka (Table 3). One important point may, however, be noted: Bangladesh's reduction in the tariff rates has been the fastest between 1989 and 1999 indicating that Bangladesh liberalized its economy at a much rapid rate compared with its neighbours.

Different export promotion measures were also adopted to diversify the export base, improve export quality and stimulate higher value added exports, and develop backward linkage industries.[6] In order to liberalize the foreign exchange market, the policy of multiple exchange rate system was replaced by a unified exchange rate in 1992 and the domestic currency (Taka) was pegged to a currency-weighted basket. A policy of creeping devaluation has been followed since then to maintain exchange rate flexibility and export competitiveness within a more market-determined exchange rate regime. The currency (Taka) has also been made convertible for all current account transactions.

Table 3
Changes in Tariff Barriers

(Per cent)

	Bangladesh		*India*		*Sri Lanka*	
	1989	*1999*	*1990*	*1999*	*1990*	*1997*
A. All products						
Mean tariff	114.0	22.1	81.8	32.9	28.3	20.0
Standard deviation of tariff rates	84.9	14.6	39.4	12.7	25.5	15.4
Weighted mean tariff	114.2	19.0	83.0	27.6	24.1	20.7
B. Primary products						
Mean tariff	85.1	21.1	74.1	28.8	31.4	23.8
Standard deviation of tariff rates	58.7	13.1	38.4	21.7	28.7	23.0
Weighted mean tariff	76.1	21.0	49.5	25.9	30.2	23.6
C. Manufactured products						
Mean tariff	123.2	22.4	84.1	34.2	27.5	19.1
Standard deviation of tariff rates	89.8	15.0	39.4	8.0	24.5	12.6
Weighted mean tariff	125.5	18.5	93.6	28.0	22.2	19.8

Source: World Bank 1999, 2000.

As a result, Bangladesh's global economic integration increased rapidly during the 1990s. While the increased share of foreign trade in GDP has been mentioned, two additional measures of global integration may also be noted: (i) importance of trade; and (ii)

[5] However, in addition to customs duty, several taxes (e.g. value added tax, supplementary duty etc.) are levied upon imports which raises the average expost tariff.

[6] The support system is, however, highly complex, fragmented and consists of wide range of measures applying in specific circumstances. Several measures may be noted e.g. special bonded warehouses, export processing zones, duty drawback, rebate on insurance premiums, income tax rebate, export credit guarantee, incentive for export of non-traditional industrial products, export promotion fund, VAT refunds, tax holiday, and retaining foreign exchange from export earnings.

importance of private capital flows. In this case, the importance of trade is measured by trade in goods as shares of both PPP GDP and goods GDP and the dynamism of trade regime is estimated by the difference in growth in real trade and growth in real GDP. For private capital flows, the measures are gross private capital flows and gross foreign direct investment as share of PPP GDP.[7] The values for Bangladesh and three other South Asian countries – India, Pakistan and Sri Lanka – are given in Table 4. These indicate that: (i) though the integration of the Bangladesh economy with the rest of the world is less compared with the average for low income countries, it compares favourably with the South Asian average; (ii) the trade related indicators, in particular, suggest rapid global economic integration of the Bangladesh economy; and (iii) Bangladesh's trade regime showed more dynamism compared with India, Pakistan and Sri Lanka.

Table 4
Bangladesh's Global Integration: A South Asian Perspective

	Trade related indicators					*Capital flow related indicators*			
	Trade in goods as % of				*Dynamism of*	*As % of PP GDP*			
	PPP GDP		*Goods GDP*		*trade regime*	*Gross private capital flows*		*Gross foreign direct investment*	
	1988	*1998*	*1988*	*1998*	*1988-1998*	*1988*	*1998*	*1988*	*1998*
Bangladesh	4.2	7.0	29.9	56.1	7.2	0.3	0.8	0.0	0.2
India	3.3	3.9	18.2	33.6	4.5	0.2	0.9	0.0	0.1
Pakistan	9.3	8.2	54.8	53.4	0.1	0.7	1.6	0.2	0.3
Sri Lanka	11.5	17.9	88.0	118.8	2.9	2.1	1.8	0.2	0.4
South Asia	4.2	4.8	24.2	40.5	...	0.3	0.9	0.0	0.1
Low income countries	6.8	8.3	38.6	62.5	...	0.7	2.0	0.2	0.9

Note: For explanations, see footnote 10.
Source: World Bank 2000.

3. Poverty, Labour Market and Employment

In this section, we shall focus on changes in two areas: poverty and income distribution, and the labour market. In a low-income country such as Bangladesh, the developments in the labour market are important determinants of poverty. The labour market's role in the country largely derives from its limitations in providing productive and gainful employment opportunities to the large majority of the labour force. With low skills and the limited scope of employment in the formal sector, the vast majority of the labour force subsists in low-productive informal activities with limited ability to generate decent incomes required for moving out of poverty.

[7] The trade in goods as a share of PPP GDP is the sum of merchandise exports and imports measured in current US dollars divided by the value of GDP converted to international dollars using purchasing power parity (PPP) rates. The trade in goods as a share of goods GDP is the sum of merchandise export and imports divided by the value of GDP less value added in services (all in current US dollars). The growth in real trade less growth in real GDP is the difference between annual growth in trade in goods and services and annual growth in GDP using constant price series. Gross private capital flows are the sum of absolute values of direct, portfolio and other investment inflows and outflows recorded in the balance of payments financial account excluding changes in assets and liabilities of monetary authorities and general government. Gross foreign direct investment is the sum of absolute values of inflows and outflows of foreign direct investment recorded in the balance of payments financial account. It includes equity capital, reinvestment of earnings, other long term capital and short term capital. For details see World Bank 2000.

Recent Trends in Poverty

The inter-temporal estimates of poverty in Bangladesh show substantial variations due to differences in underlying assumptions and methodologies.[8] Nevertheless, some trends can be discerned with the available data (Table 5). It shows that the incidence of poverty, as measured by the head-count index, declined to 50 per cent in 2000 from 59 per cent in 1983/84. Both urban and rural poverty have declined although the incidence of rural poverty remains higher than that of urban poverty. Over the entire period since the early 1980s, poverty incidence has declined at a slow rate with substantial variations over different sub-periods and between rural and urban areas. Between 1984 and 2000, rural poverty declined by only 7 percentage points. Given the fact that 80 per cent of the poor live in rural areas, total poverty incidence declined by only 9 percentage points although the decline in incidence of urban poverty has been higher. Moreover, the absolute number of the poor increased to 63 million from 56 million between 1984 and 2000 – an increase of 7 million over a period of 16 years when total population increased by about 30 million.

Table 5

Changes in Incidence of Poverty in Bangladesh

Year	Head count ratio (per cent)			Number of poor (million)		
	Rural	**Urban**	**Total**	**Rural**	**Urban**	**Total**
1983/84	59.6	50.2	58.5	50.3	5.6	55.9
1988/89	59.2	43.9	57.1	53.7	5.7	59.4
1991/92	61.2	44.9	58.8	57.5	6.4	63.9
1995/96	55.2	29.4	51.0	53.6	5.7	59.3
2000	53.0	36.6	49.8	53.5	9.2	62.7

Note: The figures are based on the Household Expenditure Surveys of the BBS. The poor have been estimated using the cost of basic needs (CBN) method and are taken as those living below the poverty line which corresponds to an intake of 2,122 kcal/person/day and a nonfood allowance corresponding to nonfood expenditure among household whose food expenditure equals the food poverty line. The number of the poor has been derived by the author using estimated population and its rural-urban distribution implicit in respective surveys.

Source: World Bank 1998, BBS 2001.

Changes in Inequality

The nature of impact of economic growth and other macroeconomic changes on poverty is influenced by changes in the distribution of income and consumption. The favourable impact of economic growth on income poverty is likely to be reduced if growth leads to increased income inequality. In Bangladesh, inequality increased rather sharply during the early 1990s which coincided with the period of rapid trade liberalization (Table 6). The Gini index of consumption expenditure in both rural and urban areas remained largely unchanged till 1992. A similar trend may also be noted for income distribution in

[8] For an analysis of the implications of different methodologies on poverty estimates, see Ravallion 1990, Ravallion and Sen 1996. The alternative poverty estimates highlight important issues of measurement of poverty, aggregation of numbers, choice of calorie norms, and other dimensions. For a review of available estimates, see Hossain and Sen 1992, Mujeri 1999.

Table 6
Changes in Growth and Inequality in Bangladesh

	Poverty line (Tk/person/month)	Mean consumption (Tk/person/month)	Mean consumption/ Poverty line (%)	Gini index (%)	
				Consump-tion	Income
Urban					
1983/84	301.72	396.53	131	29.8	37.0
1988/89	453.65	695.19	153	32.6	38.1
1991/92	534.99	817.12	153	31.9	39.8
1995/96	650.45	1,372.47	211	37.5	44.4
2000	724.56	1,291.53	178	36.6	45.2
Rural					
1983/84	268.92	284.84	106	24.6	35.0
1988/89	379.08	435.39	115	26.5	36.8
1991/92	469.13	509.67	109	25.5	36.4
1995/96	541.77	661.47	122	27.5	38.4
2000	634.48	820.20	129	29.7	36.6

Source: BIDS 2001, BBS 1998, 2001.

both rural and urban areas. The urban Gini index for consumption expenditure, however, rose sharply to nearly 38 per cent in 1996 (from 32 per cent in 1992) in urban areas and marginally declined to 37 per cent in 2000. In rural areas, inequality in consumption expenditure also increased. In the case of income inequality, the trends were similar with a sharp increase in Gini index during the mid-1990s. Moreover, income inequality is much higher than consumption inequality in both rural and urban areas. One may also note that urban inequality increased more than rural inequality along with widened disparity between rural and urban areas.

Labour Force, Employment Pattern and Wage Levels

During the 1990s, labour force in Bangladesh increased rapidly from 51.1 million in 1991 to 60.3 million in 2000 indicating an annual growth rate of 1.9 per cent. In other words, around 1 million people have entered the labour force annually and, with the current demographic growth, the trend is likely to continue for the next two decades even if the present declining trend in fertility continues.[9]

The sectoral pattern of employment reveals the dominance of agriculture (Table 7). The changes in the distribution of activities in the non-agricultural sector reveal two striking developments: (i) decline in the share of employment in the manufacturing sector; and (ii) shift in labour force to non-agricultural activities mostly in the service sectors.[10] The changes in the employment pattern are also characterized by a very high level of informal sector

[9] A major factor in expansion of the labour supply is the growth of working age population. Since 1991, the working age population aged 10 years and over has grown by 2.5 per cent per year although the labour force participation rate has declined from 69.6 per cent in 1991 to 65.8 per cent in 2000. During the period, the rural labour force increased by 22 per cent (1.6 per cent per year) while the labour force in urban areas increased by 37 per cent (2.8 per cent per year) indicating the effects of rapid urbanization and rural-urban migration.

[10] The declining share of manufacturing employment (which indicates that around 3 million people left the sector between 1989 and 2000) is somewhat paradoxical since the manufacturing value added grew at an average rate of around 7 per cent per year during the same period. An examination of the disaggregated data indicates that a significant part of the decline in manufacturing employment can be attributed to a change in classification of female (mostly unpaid family) workers processing food and beverages. While earlier classification put them as manufacturing unpaid family worker devoting to household economic activity, the later surveys classified them as agricultural unpaid family workers.

employment, employing more than 80 per cent of the employed population over 15 years. In other words, almost 42 million people were engaged in the informal sector in 2000.[11]

Table 7
Employed Persons by Major Industry

	1989	1990/91	1995/96	1999/00
Total (million)	50.1	50.2	54.6	58.1
	Share in per cent			
Agriculture	65.1	66.5	63.2	62.3
Manufacturing	14.0	11.8	7.5	7.4
Construction	1.2	1.0	1.8	2.1
Transport, storage, communication	2.5	3.2	4.2	4.6
Trade, hotel, restaurant	8.2	8.6	11.2	12.0
Community, personal services	3.6	3.8	9.3	7.4
Household sector	4.8	4.6	2.2	2.6
Other industries[1]	0.6	0.5	0.6	1.6
Total	100	100	100	100

[1] Other industries include mining, electricity, gas and water, finance and business services.
Source: Labour Force Surveys, various years.

Despite the overall increase in the level of employment during the period, significant imbalances in the labour market exist. The total labour force increased from 51.2 million in 1991 to 60.3 million in 2000 (that is, by nearly 18 per cent). Over the same period, the number of employed persons increased by about 16 per cent – from 50.2 million to 58.1 million. This indicates that the unemployment rate nearly doubled during the period from 1.9 per cent to 3.7 per cent.[12] A more serious concern, however, is the high rate of underemployment.[13] The problem of underemployment reflects the fact that more than 35 per cent of the employed labour work less than 35 hours a week, a low level for a developing country such as Bangladesh. At the end of the 1990s, around 39 per cent of the total labour force were either unemployed or underemployed.

Education, Skill Achievement and Wages

The level of education and achievement in basic skills is strongly related to the productivity and earnings of the labour force. With increasing access to educational opportunities over the years, the educational profile of the labour force has improved in Bangladesh providing better potential for skill development. This is reflected in the fact that

[11] As in other developing countries, Bangladesh's labour market is characterized by the co-existence of formal and informal segments. In the formal sector, employment relationships are contractual and governed by labour laws and regulations. As a result, wages in this 'protected' sector are usually higher and the jobs are more secure. In the informal sector, wages are unprotected and jobs are far more insecure than in the formal sector. In many respects, the informal segment is considered as the residual of a distorted labour market where labour unions, minimum wages and various government regulations push wages in the formal sector to higher than equilibrium levels rationing a part of the workers into the 'inferior' informal sector. In any case, the informal sector dominates most industries in Bangladesh except the energy sector (gas, electricity and water) and finance and business services. In 1996, the proportion of the informal sector (both rural and urban) was 87 per cent of the total employed population in the country.

[12] A person of age 10 years and over is considered as unemployed if he/she did not work at all during the preceding week of the survey (even an hour) and was actively looking for work or was available for work but did not work due to temporary illness or because there was no work available. While the above definition conforms to the recommendations of the ILO, the low rate is usual in a country like Bangladesh since everybody has to find some work (even for few hours per day) in order to survive and maintain his/her family. As a result, the inefficiency of the labour market is not reflected in this standard unemployment rate.

[13] The state of underemployment is the condition in which a person's employment is considered inadequate in terms of time worked, income earned, productivity or use of his/her skills, and the person is looking for additional work in conformity with his/her skill to increase income. Underemployment is currently measured in Bangladesh only on the basis of hours worked. Any person working less than 35 hours during the reference week is considered as underemployed.

the share of the labour force with no education declined from 58 per cent to 49 per cent between 1991 and 2000.

As a labour abundant economy and with the existence of significant imperfections in the labour market, the trends in wages reveal substantial differentials across sectors and different skill groups. The average wages for skilled workers in the manufacturing and construction sectors and the unskilled agricultural labourers are given in Table 8. In 1998/99, the wage rate of a skilled worker in the construction sector was 50 per cent higher than the wage rate of a skilled manufacturing worker. This, however, reflects a declining differential between the skilled workers of the two sectors which was more than 70 per cent in 1984/85. But, the striking feature is the increasing gap between the wage rates of unskilled agricultural labourers and the skilled manufacturing and construction workers. During 1984/85, a skilled worker in the manufacturing and the construction sectors received 1.28 and 2.19 times the daily wage rate of an unskilled agricultural worker respectively. This differential reached 2.35 and 3.52 respectively during 1998/99.[14] In effect, the workers employed in the agriculture sector are paid less than in any other sector of the economy.[15] The low level and the slow pace of growth of agricultural wages have been largely due to the relatively high level of unemployment and underemployment recorded in the agriculture sector.

Table 8
Wage Differential between Skilled and Unskilled Labour

		1984/85	1989/90	1995/96	1998/99
1.	**Wage rate (Taka/day)**				
	Skilled manufacturing workers	31.32	58.51	77.60	98.46
	Skilled construction workers	53.44	103.85	119.62	147.62
	Unskilled agricultural workers	24.45	31.35	37.33	41.88
2.	**Ratio: Unskilled/Skilled**				
	Manufacturing	0.78	0.54	0.48	0.43
	Construction	0.46	0.31	0.65	0.28

Source: BBS 2001.

4. Trade Liberalization and Poverty: Simulation Outcomes with a General Equilibrium Framework

In this section, we discuss some simulation results of globalization measures on poverty and income distribution using a general equilibrium model of the Bangladesh economy.[16] The model was numerically calibrated to a 1995/96 Social Accounting Matrix (SAM). The disaggregation of factors, households, activities and institutions in the SAM and the CGE model is given in Table 9. The model is a 'standard' one and its main features are given in Table 10. In the present paper, we report the results of two simulations which are in line with the measures of globalization adopted in Bangladesh.

Simulation 1 (Sim1): In this simulation, the base values of the tariff rate are set equal to zero to encourage the volume to trade to expand such that the "openness" indicator of globalization is enhanced. Consequently, the base values of all other parameters are retained. The base and simulation values of the tariff rates are presented in Table 11.

[14] Unfortunately, the available data provide incomplete information on trends about wages in the services sector and in the garments sector where most of the employment has been created during the 1990s. These, therefore, have not been considered.

[15] During 2000, the average daily wage in agriculture was Tk. 50.70 compared with Tk. 69.50 in manufacturing sector, Tk. 65.60 in trade, restaurant, hotel, and Tk. 74.30 in transport sector. Substantial gender difference also exists; males earn around 60 per cent more than females when they are daily labourers. See BBS 2002.

[16] The results are drawn from an ESCOR project 'Exploring the Links Between Globalization and Poverty in South Asia' under the ESCOR programme on Globalization and Poverty and MIMAP-Bangladesh. For details see Khondker and Mujeri 2002.

Table 9
Disaggregation and Description of Factors, Institutions and Households in the SAM and CGE Model

Set	Description of Elements
Factors of Production	
Labour (6)	• **Female:** 3 categories according to skill levels (low, medium and high) Low: grades 0-5; Medium: grades 6-10; High: grades 11 and above • **Male:** 3 categories according to skill levels (low, medium and high) Low: grades 0-5; Medium: grades 6-10; High: grades 11 and above
Capital (1)	• 1 type only
Institutions	
Households (7)	• **Rural** *Agriculture*: 3 categories according to land ownership Labourer household: 0-0.49 hectares; Small Farmers: 0.5-2.49 hectares, Large Farmers: >2.5 hectares. • **Rural** *Non-Farm*: 1 category according to occupation • **Urban:** 3 categories according to the level of education of the household's head Low Skilled: grades 0-5; Medium Skilled: grades 6-10; and Professional: grades 11 and above
Others (2)	• Government • Rest of the World
Activities	
Agriculture (7)	• **Crops** *Non-traded*: Rice (Aman and Boro) • **Crops** *Traded*: Other Grains and Commercial Crops • **Non-crops** *Non-traded*: Forestry • **Non-crops** Traded: Livestock and Fish
Industries (12)	• **Food Processing** *Traded*: Rice Milling, Atta and Flour, Other Food and Tobacco • **Textiles** *Traded*: Clothing, Ready Made Garments and Leather. • **Others** *Traded*: Chemicals, Fertilizer, Petroleum Products, Machinery and Miscellaneous Industries
Services (6)	• *Non-Traded*: Construction, Gas, Trade Services, Social Services, Public Administration, Financial Services and Other Services

Table 10
Summary of CGE Model Features of the Bangladesh Economy

• Labour factor is mobile across producing activities.
• Capital is immobile and sector specific.
• Primary factor supplies are exogenous and fixed.
• The world prices of imports and exports are exogenous invoking the small country assumption.
• Current account balance (deficit) is fixed.
• Imports and domestically produced goods are imperfect substitutes.
• Output produced for domestic and export markets reflects differences in quality.
• Savings of domestic institution adjust to equate to given investment.
• General price index acts as the numeraire.
• Excess demand conditions are satisfied.

Table 11
Tariff Rates for Base Year and Simulation Experiment

	Base Year		Simulation 1	
	Import values	**Tariff Revenues**	**Tariff Rates**	**Tariff Rates**
Grains	4.21	0.69	16.51	0.00
Commercial Crops	7.49	0.54	7.18	0.00
Livestock	2.34	0.00	0.00	0.00
Fish	0.00	0.00	0.00	0.00
Forestry	0.00	0.00	0.00	0.00
Rice Milling	0.57	0.02	3.43	0.00
Ata and Flour Mill	0.04	0.00	12.16	0.00
Other Food	8.39	3.14	37.42	0.00
Leather	0.28	0.00	0.00	0.00
Cloth	22.90	5.59	24.42	0.00
Ready Made Garment	1.37	0.04	2.96	0.00
Tobacco	0.11	0.002	2.04	0.00
Chemical	24.01	5.04	20.98	0.00
Fertilizer	2.84	0.00	0.08	0.00
Petroleum Products	9.78	4.61	47.15	0.00
Machinery	70.98	12.69	17.88	0.00
Miscellaneous Industry	99.01	6.62	6.69	0.00
Average	**254.33**	**39.00**	**15.33**	**0.00**

Simulation 2 (Sim2): In the simulation, the base value of foreign savings is augmented (i.e. from 3 percent of GDP to 5 percent) to reflect the pattern of foreign investment inflow into Bangladesh during the last few years. The inflows of foreign investment are concentrated mainly in the "gas" sector depicting the rise in "foreign investment to GDP ratio" (e.g. investment indicator of globalization) as well as invoking the deleterious impacts of such investment. The base values of all other parameters are retained.

Simulation Outcomes

Impacts on Macro Indicators

The impacts on selected macro indicators are reported in Table 12. The real GDP growth in *simulation one* is 2.43 percent compared with the base case. The complete elimination of the tariffs (which were mainly concentrated on a few manufacturing sectors) leads the resources to move from the protected (i.e. manufacturing) to the unprotected sectors (i.e. agriculture and services). Such a reallocation of resources results in higher growth of agriculture (0.73 per cent) and service (0.84 per cent) sectors. The experience of the manufacturing sector is mixed with respect to growth and allocation of resources. Resources move from some manufacturing activities and these are the major losers of tariff elimination. Such sectors belong to the "import-substituting" type of manufacturing activities. On the other hand, the elimination of tariff rates depreciates the nominal exchange rate, which helps to increase Bangladesh's exports. Thus, resources also move to the export oriented manufacturing sectors. The net effect on the manufacturing activity is the growth of the sector by 0.86 percent compared with the base case.

Table 12
Selected Macro Effects of the Simulations with the Model

	Shares (%)	Growth Rates (%)	
	Base Case	*Simulation 1*	*Simulation 2*
Real GDP		**2.43**	**0.21**
Agriculture	0.22	0.73	-0.004
Manufacturing	0.22	0.86	-0.93
Service	0.56	0.84	1.14
Traded	0.33	1.40	-1.13
Non-traded	0.67	1.03	1.33
Consumption		**1.38**	**0.95**
Imports		4.23	12.89
Exports		14.77	-11.19
Trade Openness		**29.54**	**28.62**

The observed pattern of manufacturing sector growth is reflected in high growth of the export sector by nearly 15 percent compared to the base case. The growth of imports by 4 per cent is moderate considering the full elimination of tariffs. Substantial depreciation of nominal exchange rates counters the large fall in the domestic import prices. These two opposing impacts on the domestic import price result in the moderate increase in import by about 4 per cent.

The patterns of growth effects under the *second simulation* are different from the first simulation. In the second simulation, the resources move from both agriculture and manufacturing sectors to generate growth in the service sector. The pattern of resource reallocation results in the growth of non-traded sectors (1.33 per cent) at the expense of the traded sectors (-1.13 per cent).

The growth of imports is relatively high (13 per cent) in the second simulation. The decline of domestic manufacturing and agriculture activities manifests in higher prices of domestic products relative to the import price of their import substitutes. This leads to the substantial growth of imports in the simulation. Similarly, higher prices of domestic supplies compared to the export prices manifests in sharp decline of exports (11 per cent) in this case compared to the base case.

Welfare Effects

In order to measure the welfare impacts of the simulations, we have calculated the Equivalent Variations (EVs). The results are given in Table 13.

Table 13
Welfare Impacts: Equivalent Variations for Different Household Groups

	Base value	Simulation 1		Simulation 2	
Household Groups	*Consumption (Billion Tk)*	*Consumption Growth (%)*	*EV*	*Consumption Growth (%)*	*EV*
Agricultural Labourers	95.59	1.25	1.19	0.75	0.71
Small Farmers	176.25	1.36	2.54	1.06	1.97
Large Farmers	188.63	1.35	2.93	1.45	3.13
Non-farms	268.77	1.33	3.9	0.91	2.65
Worker-Low Skilled	168.94	1.41	2.47	0.89	1.56
Worker-Medium Skilled	151.75	1.46	3.03	0.89	1.84
Professionals	329.07	1.35	5.57	0.76	3.10
Total	**1379.00**	...	...	...	...

It can be observed that, in *both simulations*, Equivalent Variations (EVs) are positive for all household groups. The positive EV values are the manifestation of positive real GDP growth and consumption growth. Except for the non-farm household group, the observed EV is larger for the relatively high-income household groups (e.g. professionals, medium skilled workers, and large farmers) compared with the low-income household groups (agricultural labourers, low-skilled workers and small farmers). This suggests that the welfare gains emanating from the globalization measures accrue more to the well-off household groups compared to their less well-off counterparts. Among the less well-off household groups, only the non-farm group is observed to benefit due to their higher participation in non-traded and service activities, which exhibit high growth under the simulations.

Poverty Implications

In the paper, Foster-Greer-Thorbecke (FGT) measure of poverty has been used to evaluate the policy effects on poverty profiles of the representative household groups. The measurement of poverty profiles has been done following the method adopted by Decaluwe et al (1999). Specifically, the methodology requires: (a) explicit proposition of income distribution formulation corresponding to each household group's characteristics and (b) postulation of an unique and constant basket of basic needs based poverty line whose monetary value is altered by endogenously determined commodity prices. The poverty profiles of the representative household groups have been derived using the following methodology.

1. The income distribution formulation depends on the "minimum" and "maximum" incomes and on the skewness of the distribution. The "Beta" distribution function (equation 1) is used to represent these characteristics of the household groups. Implementation of "Beta" distribution requires minimum (miny) and maximum (maxy) incomes within each of the seven groups and values of shape and skewness parameters (i.e. p and q) of the distribution. The derived intra-group distribution of each of the seven household groups, using the 1995/96 Household Expenditure Survey (HES 95/96), is used to estimates these parameters and values of minimum and maximum incomes. The reported minimum and maximum incomes and estimates values of p and q parameters are given in Table 14.

$$I^h(y^h, p^h, q^h) = \frac{1}{B^h(p^h, q^h)} \cdot \frac{(y^h - mny^h)^{p^h-1} \cdot (mxy^h - y^h)^{q^h-1}}{(mxy^h - mny^h)^{p^h+q^h-1}}$$

$$B^h(p^h, q^h) = \int_{mn^h}^{mx^h} \frac{(y^h - mny^h)^{p^h-1} \cdot (mxy^h - y^h)^{q^h-1}}{(mxy^h - mny^h)^{p^h+q^h-1}} dy \qquad (4.1)$$

2. The derived distribution have been used to assess the poverty implication within each of the household groups. It is assumed, following a policy change, that intra-group distributions shift proportionally due to mean income change implying constancy of intra-household distributions. That is, if the mean income changes by k factor, the income of each household within the group also alters by k factor. Analogously, minimum and maximum income of each household group will also alter. Income effects of the simulations are given in Table 15.

3. The per capita incomes of each household group are then contrasted with the poverty line to derive the poverty profiles. Two poverty lines applicable for rural and urban locations have been defined to capture price and other characteristics. The poverty lines (i.e. z in equation 3) are determined endogenously within the CGE model. The poverty lines are determined by a basket of quantities of commodities reflecting the basic needs (BN). Although, the basket (ω_i^l) remains invariant under different simulations, commodity price (P_i) changes alter the monetary values of the poverty lines. A rise in commodity prices will shift the poverty line to the right (compared to the base case) and vice versa.

Monetary Poverty Line: $$z^l = \sum_i^l \omega_i^l \cdot P_i \qquad (4.2)$$

4. The above estimates (i.e. Beta distributions and poverty lines) have been used in the FGT poverty measure to derive pre and post simulations poverty incidence for the seven representative household groups. This class of measures satisfies the desirable axioms and allows us to measure poverty incidence for different groups that adds up to the total.[17] The FGT ($P\alpha$) also allows us to compare three measures of poverty: head count ratio ($\alpha = 0$); poverty gap index ($\alpha = 1$) and squared poverty gap index ($\alpha = 2$). The simplest measure of the prevalence of poverty, headcount ratio, is the proportion of population with a per capita income below the poverty line. The depth of poverty is measured by the poverty gap index, which estimates the average distance separating the income of the poor from the poverty line as a proportion of the income indicated by the line. The severity measure given by the squared poverty gap index quantifies the aversion of the society towards poverty. All three measures for rural and urban population may be computed using the following formula:

$$P_\alpha^h = \int_{mny^h}^{z^l} \left(\frac{z^l - y^h}{z^l} \right) \cdot I^h(y^h, p^h, q^h) dy^h \qquad (4.3)$$

[17] Any poverty measure is generally expected to satisfy the following three desirable axioms. (1) Focus axiom, which requires poverty measures to be insensitive to increase in income of a non-poor person; (2) Monotonocity axiom refers to the condition where a reduction in a poor persons' income should increase the value of the poverty measure; and (3) Transfer axiom, which demands that, *ceteris paribus*, a transfer of income from a poor to a richer poor person should raise the value of the poverty index. For further details see Subramanian (1997).

where,

$l \in$ {rural, urban} refers to location;

$h \in$ {1,2, ..., 7} refers to the seven household groups considered;

P_α^h is the FGT index by household groups.

The base year poverty profiles of the household groups and in rural and urban locations are provided in Table 14 which highlights the following features:

- Almost 53 percent of the rural population are poor while in urban areas it is around 28 percent. This suggests that the incidence of poverty in rural areas is much higher than in urban areas. Moreover, poverty gap and severity of poverty observed for rural areas envisage that rural poverty situation is much worse than urban poverty.
- Among the rural households, the agricultural labour households are the most deprived group. More than 78 per cent of them are poor. In terms of poverty gap and severity index, they are also found to be the most vulnerable group. With regard to incidence of poverty, this group is followed closely by small farmer and non-farm household groups.
- As expected, the incidence of urban poverty is concentrated mainly among the low skilled worker household group. More than 37 percent of them have income less than the urban poverty line. High values of the poverty gap and the squared poverty gap ratios (0.14 and 0.07 respectively) of this group reconfirm their vulnerability. The incidence of poverty is small for the other two urban household groups.

Table 14
Base Values of Household Poverty Profiles

	Income (Tk per capita per month)				Population	Beta		FGT Poverty Measure		
Household	Minimum	Maximum	Mean	Poverty line	Share (%)	p	q	Head Count	Poverty Gap	Squared Poverty Gap
Rural	18	9140	697	650	78.65	2.9	37	0.535	0.197	0.099
Agricultural Labourers	73	4245	507	650	29.63	2.9	26	0.781	0.305	0.153
Small Farmers	152	6369	694	650	21.65	2.3	24	0.523	0.164	0.070
Large Farmers	18	9140	981	650	11.32	2.7	22	0.293	0.097	0.047
Non-farms	91	6935	721	650	37.41	2.3	22	0.486	0.168	0.079
Urban	73	26533	1359	725	21.35	1.7	33	0.287	0.109	0.057
Workers-Low Skilled	73	16376	987	725	58.60	2.3	38	0.377	0.136	0.066
Workers-Medium Skilled	441	14833	1884	725	21.92	1.3	11	0.107	0.019	0.005
Professionals	358	26533	2927	725	19.48	1.4	12	0.062	0.013	0.004

Among others, the incomes of the representative household groups and the commodity prices are altered as a result of the policy changes under the simulations. The changes in incomes and prices also change the minimum and the maximum incomes within each household group and the monetary values of the rural and urban poverty lines. The estimated post simulation values of the minimum and the maximum incomes and the poverty lines are given in Table 15.

Table 15
Income Effects Under Alternative Simulations

	Simulation 1				Simulation 2			
Household Groups	Minimum	Maximum	Mean	Poverty line	Minimum	Maximum	Mean	Poverty line
Rural	23	11,614	886	806	20	10,242	780	728
Agricultural Labourers	93	5,404	646	806	82	4,770	570	728
Small Farmers	193	8,100	882	806	170	7,141	778	728
Large Farmers	23	11,614	1,247	806	20	10,242	1,099	728
Non-farms	116	8,831	918	806	102	7,763	807	728
Urban	93	33,826	1,734	899	82	29,595	1,516	812
Workers-Low Skilled	93	20,837	1,256	899	82	18,360	1,107	812
Workers-Medium Skilled	565	18,990	2,412	899	490	16,474	2,092	812
Professionals	456	33,826	3,731	899	399	29,595	3,265	812

These estimated values of income and the new prices generated under the simulations have been used in the FGT index to derive the post simulation poverty profiles. The poverty profiles under the two simulations are presented in Table 16 from which the following major impacts of the changes may be identified:

Table 16
Impacts of Policy Simulations on Poverty Profiles

	Simulation 1			Simulation 2		
Household Groups	Head Count P_0	Poverty Gap P_1	Severity P_2	Head Count P_0	Poverty Gap P_1	Severity P_2
Rural	0.514	0.187	0.094	0.534	0.196	0.099
Agricultural Labourers	0.762	0.293	0.145	0.778	0.304	0.152
Small Farmers	0.503	0.155	0.065	0.522	0.164	0.065
Large Farmers	0.280	0.092	0.044	0.293	0.097	0.046
Non-farms	0.468	0.160	0.075	0.486	0.168	0.079
Urban	0.276	0.104	0.054	0.288	0.110	0.058
Workers-Low Skilled	0.363	0.124	0.059	0.377	0.130	0.063
Workers-Medium Skilled	0.097	0.016	0.004	0.110	0.020	0.005
Professionals	0.058	0.012	0.004	0.063	0.014	0.004
	Percentage Change from the Base Run					
	Head Count P_0	Poverty Gap P_1	Severity P_2	Head Count P_0	Poverty Gap P_1	Severity P_2
Rural	-3.82	-4.93	-5.57	-0.11	-0.30	-0.53
Agricultural Labourers	-2.32	-4.10	-5.18	-0.27	-0.49	-0.61
Small Farmers	-3.73	-5.34	-6.53	-0.08	-0.06	-6.53
Large Farmers	-4.21	-4.86	-5.57	-0.02	0.00	-0.28
Non-farms	-3.75	-5.00	-5.88	0.052	0.052	0.045
Urban	-3.84	-4.52	-5.01	0.42	0.80	0.95
Workers-Low Skilled	-3.74	-9.10	-9.71	0.00	-4.33	-4.37
Workers-Medium Skilled	-9.64	-13.52	-19.06	2.49	3.82	5.14
Professionals	-6.92	-9.52	-11.99	1.17	1.68	2.18

(i) Due to relatively high growth of income in the *first simulation,* poverty status of all household groups has improved. The gain, however, is marginally higher for the urban households compared with the households who reside in the rural location. The highest gains, in terms of reduction of poverty, are observed for the relatively well-off household groups. The highest reduction in poverty is observed for the medium skilled households (10 per cent), followed by the professionals (7 per cent) and the large farmers (4 per cent) groups. One reason for the relatively higher gains in terms of poverty reduction for these groups is the fact that the depth and the severity of poverty were not intense, to begin with, for these relatively well-off household groups. Therefore, a small increase in real income has been able to move a significant portion of the poor population of these household groups out of poverty as compared with the less well-off households whose depth and severity of poverty are more intense.

(ii) In the second simulation, the poverty situation in the rural location improved in contrast to the generally worsening poverty situation in the urban location. The head count index of poverty declined by 0.11 percent in the rural location which increased by 0.42 percent in the urban location. One important observation, however, is that the poverty situation worsened for all relatively well off household groups except the large farmers. The rise in the incidence of poverty can be specifically noticed for the medium skilled workers (2.5 per cent), and the professionals (1.2 per cent) households. The relatively large decline in the manufacturing income in the simulation led to a reduction in the real incomes of these two household groups. The fall has been manifested in widening of the poverty gap, deepening of the severity of poverty and worsening of the head count index.

What policy conclusions can we draw from the above results? The simulations suggest that, while the globalization efforts in Bangladesh are generally pro-poor, the gains are relatively small and these differ across various household groups in the presence of structural bottlenecks and other constraints. In particular, the gains accrue more to the relatively well-off households while the extreme poor households benefit less. This indicates that the full potential of globalization is not readily translated into poverty reduction in Bangladesh.

5. Skilled-Unskilled Wage Inequality: An Analysis of Observed Changes

In Bangladesh, as we have noted in Section 3, the wage increase of the skilled workers were significantly higher than the unskilled workers since the 1980s leading to widening income (wage) inequality between the skilled and the unskilled labourers. Since extensive liberalization of Bangladesh's external sector also took place during the same period, this indicates the likely existence of some association between observed increase in wage inequality during the period and the trade reform measures. However, trade reforms may not be the only factor that contributed to the widening of the wage gap of the period. On the contrary, wage and trade literature points to the existence of several other factors, which could explain a significant part of the changes in wage inequality other than the trade factors. In this section, following Abrego and Whalley (2000) a double calibration general-equilibrium methodology has been used to decompose the observed inequality in wages generated by multiple sources into the components associated with each source. The method departs from the traditional applied general equilibrium exercise in two ways. First, it decomposes an observed (*ex post*) economic outcome into component influences; rather than

computing *ex ante* counterfactual equilibria. The approach further recognizes the fact that these influences need not, and typically will not, be additive. Second, the analysis is based on a two-period rather than a single period calibration, since it requires model parameterizations to be as consistent as possible with changes over time, not just the base year observation.

We have applied the technique to a component decomposition of the increased wage inequality between 1985 and 1996 in Bangladesh.[18] The model and the techniques we present here suggest that within a general equilibrium setting, other factors such as changes in factor supply and a wider variety of technical changes also enter the picture and play a significant role in explaining wage differentials between the skilled and the unskilled labour in Bangladesh.

The Methodology and Model Structure

In order to operationlize the double calibration decomposition analysis for assessing the contribution of different factors underlying the observed wage inequality changes over the period, the model of a small, open price taking economy for Bangladesh has been specified. The model has been calibrated to the data for two years (1985 and 1996) using the Ricardo-Viner specific factors specification rather than the Hecksher-Ohlin-type fully mobile factors model specification. The use of the Ricardo-Viner specification as opposed to the Heckscher-Ohlin-specification in a similar exercise has been argued by Abrego and Whalley (2000)[19]. In order to implement the methodology, Bangladesh's economic structure has been assumed to consist of two goods: agriculture and non-agriculture. For our purpose, we have assumed that agriculture is intensive in unskilled labour while non-agriculture is intensive in skilled labour. For the analysis, it is also assumed that agriculture is importable and non-agriculture is exportable (since more 70 per cent of the exports from Bangladesh are manufacturing textiles of various types). The main features of the model framework are the following.

We assume a small open price taking economy that produces two goods, M and E, both of which are traded at fixed world prices in period $t, P_{it}; i=M,E$. The production of each good in each period requires the use of two mobile factors: skilled labour, S, and unskilled labour U, and an unspecified sector specific fixed factor. Production, consumption and trade take place in each of the two time periods, 1 (1985) and 2 (1996), which are denoted as the initial and terminal periods. Each good in each period is produced according to a decreasing return to scale technology:

$$Y_{it=A_{it}} L_{it}^{\alpha_{it}} \qquad \text{i=M,E; t=1,2} \qquad (5.1)$$

[18] For details, see Mujeri and Khondker, 2002.

[19] Abrego and Whalley argue that, "the attraction of Heckscher-Ohlin-type models has been that these provide a simple widely used analytical framework in which the relationship between relative wages and relative price changes is clearly defined. However, we do not use this model form because there are problems with its empirical implementation. One is that for convenient functional forms, the Heckscher-Ohlin model with homogeneous goods and constant returns to scale has problems in accommodating relatively large product price changes. Conventional Heckscher-Ohlin structures are also incapable of accommodating factor-biased technical change as a source of wage change for the small open economy case (Leamer, 1998; Krugman, 2000). One way of dealing with these difficulties is to abandon the assumption of homogeneous goods in preferences, and use an Armington-type structure. Although Armington models have been widely used in the applied general equilibrium literature, they are harder to work with analytically and hence no general results linking changes in relative prices with relative wages can be derived. A second approach consists of moving away from full mobility of all factors, and using a specific factors trade model (Ricardo-Viner) with decreasing returns to scale—a structure that has been more widely explored in the analytical literature of international trade (Jones, 1971; Samuelson, 1971; Mussa, 1974). We follow the second approach, modelling fixed factors in each sector, as well as two fully mobile factors (skilled and unskilled labour). This yields decreasing returns in each sector with respect to a composite of skilled and unskilled labour."

where, Y_{it} refers output of good i in period t,. A_{it} denotes a sector specific measure of the efficiency of a composite labour factor input, and L_{it} is use of a composite labour input. α_{it} is the output elasticity with respect to composite labour.

The composite labour input in each sector, L_{it}, is a CES aggregate of unskilled and skilled labour U and S,

$$L_{it} = \beta_{it}\left[\beta_{it}(\delta_{it}^{u} \cdot U_{it})^{(\rho_{it}-1)/\upsilon_{it}} + (1-\beta_{it})(\delta_{it}^{u} \cdot S_{it})^{(\rho_{it}-1)/\rho_{it}}\right]^{\frac{\rho_{it}}{\rho_{it}-1}} \qquad (5.2)$$

where, B_{it} defines units of measurement for composite labour, and β_{it} is the CES share parameter in the aggregation function. δ_t^U and δ_t^S are factor–augmenting technical change parameters which capture changing input quality over time. ρ_{it} denotes the elasticity of substitution between $\delta_t^U U_{it}$ and $\delta_t^S S_{it}$. Combining equations (5.1) and (5.2) for each sector in each period, we have

$$Y_{it} = \gamma_{it}\left[\beta_{it}(\delta_{it}^{u} \cdot U_{it})^{(\rho_{it}-1)/\upsilon_{it}} + (1-\beta_{it})(\delta_{it}^{u} \cdot S_{it})^{(\rho_{it}-1)/\rho_{it}}\right]^{\frac{\alpha_u \rho_{it}}{\rho_{it}-1}} \qquad (5.3)$$

where, the units parameter in the consolidated function $\gamma_{it} = A_{it}B_{it}$. In (5.3), changes in γ_{it} represent sector-specific (Hicks-neutral) technical changes, while changes in δ_t^U and δ_t^S reflect factor-biased technical change. In the empirical implementation of the model, it is assumed that production of the importable good, M, is intensive in unskilled labour in both periods, i.e. $\beta_{Mt} > \beta_{Et} \forall t$.

In the model, labour markets are assumed to be competitive, so that each type of labour is paid its marginal value product, ensuring full employment in equilibrium of each type of labour in each period. The endowments of unskilled and skilled labour (i.e. U_t and S_t respectively) even though are assumed to be fixed in each time period, they vary across periods. The first order conditions for factor demands implied by marginal product pricing are:

$$W_{ut} = P_{it}\alpha_{it}\beta_{it}\delta_{it}Y_{it}^{[\rho_{it(\alpha_{it}-1)+1}]/\alpha_{it}\rho_{it}/U^{\rho_{it}\gamma(\alpha_{it}\rho_{it}/\rho_{it}-1)}} \qquad (5.4)$$

$$W_{st} = P_{it}\alpha_{it}(1-\beta_{it})\delta_{it}Y_{it}^{[\rho_{it(\alpha_{it}-1)+1}]/\alpha_{it}\rho_{it}/S^{\rho_{it}\gamma(\alpha_{it}\rho_{it}/\rho_{it}-1)}} \qquad (5.5)$$

where, W_{ut} and W_{st} denote unskilled and skilled wage rates respectively, and P_u are the (fixed) world prices of goods in each period t. Given the decreasing returns technology set out in (5.1), payments to unskilled and skilled labour do not exhaust the value of production in either sector, and the remaining return implied by (5.1) accrues to the fixed factor in each sector.

In equilibrium a zero trade balance condition holds, i.e.,

$$\sum_{i=M,E} P_{it}T_{it} = 0 \qquad (5.6)$$

where, T_{it} denotes the net trades of the country in the two goods, M and E. The sign convention is that if good i is exported, domestic production less consumption is positive; if good i is imported this difference is negative. Imports and competitive domestically produced goods are treated as homogeneous, as is also the case with exports (i.e. trade is of homogeneous goods). This homogeneity assumption implies that trade flows involving any good are always one-way, and that one of the goods is exported and the other imported.

Trade shocks are modeled in the framework in the form of changes in world prices, which, in turn, typically induce increased import volumes. A fall in the relative price of unskilled intensive to skill intensive goods between the initial and terminal years is considered as trade shock. These generate larger import volumes in the model, adjustment out of the unskilled intensive sector, and increases in exports.

Given the small open economy assumption underlying the model, goods markets do not clear domestically since imports and exports represent positive and negative excess demands. These are absorbed or met by world markets subject to trade balance, with perfectly elastic demands and supplies at world prices. Equilibrium in each period in this model is thus given by unskilled and skilled wage rates such that the two domestic labour markets clear. The value marginal product of each mobile factor in each sector is equal to the corresponding wage rate as in (5.4) and (5.5), and the implicit fixed factor in each sector i receives the residual in return, F_{it}, in period t. Market clearing conditions of this form hold in both periods, i.e.

$$\sum_i U_{it} = \overline{U_t}, \qquad \text{i=M,E; t=1,2} \tag{5.7}$$

$$\sum_i S_{it} = \overline{S_t}, \qquad \text{i=M,E; t=1,2} \tag{5.8}$$

In the model, the two market-clearing conditions (5.7) and (5.8) determine the skilled and unskilled wage rates that clear markets in mobile factors. The fixed factor in each sector receives the residual between the value of production at world prices and payments to factor inputs. This enters incomes which, in turn, finance goods demands.

Consumption of each good in equilibrium is given by the difference between production and net trade, i.e.

$$C_{it} = Y_{it} - T_{it}, \qquad \text{i=M,E; t=1,2} \tag{5.9}$$

where, C_{it} denotes consumption of good i in period t.

A property of equilibrium in such a model (from Walras Law) is that trade balance will be satisfied.

The model, calibrated in the techniques specified above, has been used to obtain estimates of the contributions of augmented trade, factor biased technical change, and change in factor endowment to explain the increases in wage inequality in Bangladesh between 1985 and 1996. The decomposition experiments have been conducted using three double calibration procedures. The changes in model technology parameters over time have been specified using two-period data (i.e. 1985 and 1996). The derived parameter values are dependent on the specific procedures implemented.

In order to assess the contribution of each individual component to wage inequality, the equilibrium of period 1 (i.e. 1985) is considered as the base model solution. Once the base solution is achieved, the model in the first simulation is resolved by considering only the trade shock, and then in successive simulations, each of the technology parameters implied by the calibration procedure are altered to examine their contribution to wage inequality. Lastly, the impact of changes in factor supply is simulated. The incorporation of all these changes together are consistent with observed wage inequality change, as well as all the other elements observed for the second period equilibrium (i.e. 1996). The contribution of each component to total change in wage inequality is then estimated.

As already mentioned, the decomposition simulations relate to the observed data of the Bangladesh economy for the two years, 1985 and 1996. The choice of the years has been dictated by the observed rise in wage inequality, increase in real GDP, and marked structural shifts in employment and value added in the economy. Moreover, the period witnessed a significant decline in the wage of unskilled workers relative to their skilled counterparts. There was a significant increase in real GDP, a rise in the trade volume (imports) and opening up of the economy and a rise in the employment of unskilled labour compared to the skilled labour in different sectors during the period.

The results of the decomposition experiments are presented in Table 17. The assumption underlying the first simulation was that the technical change was factor-biased and hence no Hicks-neutral technical (i.e. sectoral) change occurred during the time (i.e. between 1985 and 1996). Contrary to the first simulation, the assumption of factor-biased technical change was dropped and Hicks-neutral change was incorporated in the second simulation. In both these simulation experiments, the production function parameter that is, the share of unskilled labour in production (β_{it}) in each sector varied over time. The third simulation allowed for both factor-biased and Hicks-neutral technical change, but β_{it} was held constant over time.

Table 17
Decomposition of Wage Inequality in Bangladesh: 1985 to 1996

Contributing Factors	Experiments		
	First	Second	Third
Increased trade	-2.25	-3.38	-3.60
Factor-biased technical change	-15.80	0	-34.79
Hicks-neutral technical change	0	42.58	-40.39
Factor endowment changes	48.25	34.15	54.13
Changes in β_{it}	-37.39	-40.62	0
Changes in α_{it}	2.48	1.67	1.59

From the results, it is interesting to note the relatively small contribution of trade in explaining the rise in wage inequality between 1985 and 1996. The contributions of trade to wage inequality have been found to be 2.3 percent, 3.4 percent and 3.6 percent respectively under the first, second and the third simulations. Large contributions have, however, been recorded for the factor-biased technical change (e.g. in simulations 1 and 3), which, in turn, vary significantly depending upon the calibration procedure used. The contributions of the factor-biased technical change in explaining wage inequality increase account for 16 per cent and 35 per cent under the first and the third simulations. The finding suggests that when changes in share parameters, β_{it}, are not allowed, the factor-biased technical change accounts for more than the observed wage inequality change. The changes in factor supply also have large negative effects on rises in wage inequality, but these are offset by the positive effects of changes in share parameters in the first and the second simulations and by the factor-biased technical change in the third simulation.

The results of the analysis suggest that the factor-biased technical change has been the major contributory factor in increasing the wage inequality between 1985 and 1996 in Bangladesh. The contribution of trade to increased wage inequality was relatively small. Moreover, the changes in factor endowments had a significant role in determining the net outcomes in wage inequality during the period. The general conclusion that emerges from the decomposition analysis indicates that skill-biased technical change is the significant determinant of wage inequality in Bangladesh. Trade liberalization and the development process in general leads to higher demand for skilled labour (which is the relatively scarce labour factor) than the abundant unskilled labour in Bangladesh. As a result, the wages of skilled labour increase at a faster rate than the unskilled wages leading to widened wage disparity. The process has significant poverty implications since the unskilled workers in the rural areas form the largest majority of the poor in Bangladesh. In view of the relative abundance of unskilled labour and the existence of significant imperfections in the labour

market, Bangladesh's pro-poor development agenda needs to focus on providing education and upgrading the skill level of the labour force which is likely to reduce the 'wage divide' between the skilled and the unskilled labour with consequent positive income effect on the poor. For the purpose, policy measures are needed to increase the supply of skilled labour in the country since higher growth and associated technological change may not necessarily lead to enhanced supply of skilled labour on its own which would result in increased wage inequality between the skilled and the unskilled labour as observed in the present simulation.[20]

6. Some Policy Implications

The analysis in the present paper highlights that trade reforms do not readily bring much benefit to the Bangladesh economy particularly to the poor. The reforms are likely to be beneficial when complemented by measures at strengthening the domestic economy, addressing structural bottlenecks, and improving the policy regimes and institutional capabilities. The standard argument that trade liberalization would lead to increased demand for labour, especially in the formal sector, is not tenable in Bangladesh. As we have seen, actual outcomes depend on the characteristics of labour and how the labour market operates. In particular, tradable goods production in the country does not use unskilled (or least skilled) workers as the most intensively used factor and many non-tradables (such as products and services of the informal sector) are more labour intensive than the tradables. As a result, with a segmented labour market, opening up of the economy brings benefit to a few groups having specific skills while the poor workers at the lower ends of the skill profiles remain the losers. In a situation like this, the costs of trade reforms can be minimized only when the economy grows robustly and has the ability to provide cushion to the sufferers against the shocks of the restructuring process.

For a country like Bangladesh, trade liberalization has both benefits and costs. But whether the benefits would outweigh the costs depend largely on how the country 'manages' the process to its advantage. In the case of Bangladesh, it is important to emphasize that if trade liberalization is undertaken in an inappropriate manner, it may contribute to a vicious cycle of trade and balance-of-payments deficits, financial instability, external debt and recession. It needs to be recognized that there is no automatic correlation between trade liberalization and growth, and Bangladesh needs to adopt appropriate phasing and sequencing of trade reforms to liberalize the economy in more strategic ways in order to participate in the global economy on its own terms. An open trade regime, on its own, will not necessarily set the economy on a sustained growth path. What is important for Bangladesh is the quality, timing, and scope of liberalization and success in promoting an accompanying process of facilitating factors such as strengthening of local enterprises, human resource and technological development, and building up of export capacity and market access. Specific and sound policies are required in areas such as infrastructure, market facilitation and access, and competitiveness to meet the challenges of the post-MFA era. In addition, effective measures are needed to increase the supply response of poor households and their ability to cope with risk and uncertainty through complementary public policies for developing small and medium enterprises and agro-based industries, improving access to the credit market, ensuring better asset distribution, increasing labour market flexibility, disseminating market and technical information, and investing in skill development.

[20] For an exposition of the argument that higher rates of technological change and growth may be accompanied by higher relative wages but lower relative supply of skilled labour, see Eicher 1996.

So far, trade reforms in Bangladesh have not been adequately linked with, and shaped by, domestic realities and supported by a complementary reform agenda in other fronts. As a result, the country gained relatively little from the trade reforms in the 1990s and, in many respects, the adjustment costs were magnified and differed across various groups in the society. In its fight against poverty, it is important for Bangladesh to judge trade reforms by how and to what extent the policies contribute to creating opportunity, ensuring equity, and reducing vulnerability of the poor. The future course of actions and specific measures in the external sector should be devised in the backdrop of the above imperatives. For moving forward, it is important for Bangladesh to establish an early warning and effective information system for the external sector to guard against possible slippage and prevent deterioration of the trade indicators along with an institutional mechanism which is capable of designing quick responses to adverse developments. A progressive expansion of the trade sector needs to be based on specific strategies and concrete plans of action in several areas including reforms in trade policy; diversification of the export base and increasing export competitiveness; strengthened system of standardization to ensure good export quality; development of food safety, plant and animal health services; development of Intellectual Property Rights (IPR) regime in conformity with the WTO standards; expansion of skilled manpower exports; strengthening the trade support capacity to cope with emerging changes in the global trade environment; and increased and effective participation in regional blocks and the WTO negotiations.

The important issue for Bangladesh is to adopt liberalization accompanied by complementary measures with the aim to minimize the negative impacts on the poor. The risks of employment and income losses for specific poor groups in a situation of continuing high unemployment in a liberalized environment are too high for Bangladesh. This also has a strong negative effect on growth prospects of the economy. Such risks highlight the importance of consistency of the macroeconomic policy regime with trade liberalization efforts. The liberalization process needs to be far more sensitive to social costs, shaped by domestic policy regimes, consistent with appropriately targeted social safety nets for the affected poor, and guided by institutional capacity to manage better the transition period of trade liberalization. At the same time, the international environment needs to be supportive of, and reduce the transition costs of, economic restructuring of the country. On the global front, along with preferential access to Bangladesh's exports in general, this means reduction of tariffs on garments and other labour-intensive exports from Bangladesh where the country can have increasing comparative advantage.

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